

## CLAIMS

What is claimed is:

- 1           1.       A method for cutting a non-metallic substrate, comprising the steps of:  
2           scanning a first laser beam for breaking molecular bonds of the non-metallic  
3           substrate material on a cutting path formed on the non-metallic substrate to form a  
4           scribe line having a crack to a desired depth; and  
5           scanning a second laser beam along a scanning path of the first laser beam to  
6           propagate the crack in a depth direction of the substrate and to completely separate the  
7           non-metallic substrate.
- 1           2.       The method of claim 1, wherein the first laser beam has a wavelength  
2           having an absorptivity of 90% or more with respect to the non-metallic substrate.
- 1           3.       The method of claim 2, wherein the non-metallic substrate is a glass,  
2           and the first laser beam is a 4<sup>th</sup> harmonics YAG laser beam having a wavelength of 266  
3           nm.
- 1           4.       The method of claim 1, wherein the first laser beam is scanned from a

2 starting point of the cutting path to an end point of the cutting path.

1 5. The method of claim 1, wherein the second laser beam is a CO<sub>2</sub> laser  
2 beam.

1 6. The method of claim 1, wherein the first laser beam has a width less  
2 than that of the second laser beam.

1 7. The method of claim 1, wherein the second laser beam is directly  
2 scanned onto the scribe line.

1 8. An apparatus for cutting a non-metallic substrate, comprising:  
2 a first laser beam generating means that generates a first laser beam for  
3 breaking molecular bonds of the non-metallic substrate material so as to heat a cutting  
4 path formed on the non-metallic substrate and to form a scribe line having a crack to a  
5 desired depth; and  
6 a second laser beam generating means that generates a second laser beam for  
7 propagating the crack along a scanning path of the first laser beam in a depth direction  
8 of the substrate.

1           9.       The apparatus of claim 8, wherein the first laser beam has a wavelength  
2       having an absorptivity of 90% or more with respect to the non-metallic substrate.

1           10.      The apparatus of claim 9, wherein the first laser beam is a 4<sup>th</sup>  
2       harmonics YAG laser beam having a wavelength of 266 nm.

1           11.      The apparatus of claim 8, wherein the second laser beam is a CO<sub>2</sub> laser  
2       beam.

1           12.      The apparatus of claim 8, wherein the first laser beam has a width less  
2       than that of the second laser beam.

1  
          13.      The apparatus of claim 8, wherein the second laser beam is directly  
scanned onto the scribe line.